Virginia City Hybrid Energy Center
Response to Data Request
Vivian Thomson, Vice Chair, Virginia Air Pollution Control Board

Question (Page No. 2):

The Virginia Hybrid Energy Facility will emit several hazardous air pollutants associated with cancer and with other serious health effects. What health risks will be caused by the Virginia Hybrid Energy Facility's emissions of hazardous (or "toxic") air pollutants?

Response:

The Virginia air regulation, Title 9, Agency 5, Chapter 60, Part II, Article 5 - Emission Standards for Toxic Pollutants from New and Modified Sources (Rule 6-5), defines significant ambient air concentration (SAAC) levels set to insure that public health is protected from hazardous substances associated with cancer and other serious health effects. The proposed Virginia City Hybrid Energy Center (VCHEC) maximum potential emissions of these hazardous substances were modeled to predict maximum ambient air quality impacts for comparison with the SAAC levels. The attached table (Attachment 1) shows that the maximum predicted ambient concentrations of the hazardous substances are all below the SAAC thresholds.

ATTACHMENT 1

Toxic Air Pollutant Analysis - Comparison to State Ambient Air Concentrations

Pollutant	Emissions (g/s)	Maximum Annual Impact (ug/m3)	Maximum 1-hr Impact (ug/m3)	TLV (mg/m3)			SAAC				Maximum Impact Percent of Hourly SAAC	Maximum Impact Percent of Annual SAAC
				TWA	STEL	CEIL	Hourly Threshold (ug/m3)	Annual Threshold (ug/m3)	Maximum Hourly Impacts Comply?	Maximum Annual Impact Comply?		
Antimony	3.21E-04	6.76E-06	2.29E-03	0.5	-	-	25	1	Yes	Yes	0.0091%	0.0007%
Arsenic	1.72E-03	3.61E-05	1.22E-02	0.2	-	-	10	0.4	Yes	Yes	0.12%	0.0090%
Beryllium	2.48E-04	5.21E-06	1.76E-03	0.002	-	-	0.1	0.004	Yes	Yes	1.76%	0.1303%
Cadmium	7.68E-05	1.62E-06	5.46E-04	0.05	-	-	2.5	0.1	Yes	Yes	0.022%	0.0016%
Chromium	1.17E-02	2.45E-04	8.29E-02	0.5	-	-	25	1	Yes	Yes	0.33%	0.0245%
Cobalt	6.39E-04	1.34E-05	4.54E-03	0.05	-	-	2.5	0.1	Yes	Yes	0.18%	0.013%
Lead	6.17E-03	1.30E-04	4.39E-02	0.15	-	-	7.5	0.3	Yes	Yes	0.59%	0.043%
Manganese	3.98E-03	8.37E-05	2.83E-02	5	-	-	250	10	Yes	Yes	0.011%	0.0008%
Mercury	1.21E-03	2.55E-05	8.61E-03	0.05	-	-	2.5	0.1	Yes	Yes	0.34%	0.025%
Nickel	7.61E-03	1.60E-04	5.41E-02	1	-	-	50	2	Yes	Yes	0.11%	0.0080%
Selenium	2.30E-03	4.84E-05	1.64E-02	0.2	-	-	10	0.4	Yes	Yes	0.16%	0.012%
Hydrogen Chloride	5.21E+00	1.10E-01	3.71E+01	-	-	7.5	187.5	-	Yes	Yes	19.8%	NA
Hydrogen Fluoride	1.83E+00	3.86E-02	1.30E+01	-	-	2.6	65	-	Yes	Yes	20.1%	NA
Acetaldehyde	3.46E-02	7.28E-04	2.46E-01	180	270	-	6750	360	Yes	Yes	0.0036%	0.0002%
Acrolein	5.90E-01	1.24E-02	4.19E+00	0.23	0.69	-	17.25	0.46	Yes	Yes	24.3%	2.70%
Benzene	6.59E-02	1.39E-03	4.69E-01	32	-	-	1600	64	Yes	Yes	0.0293%	0.0022%
Benzyl Chloride	3.55E-02	7.47E-04	2.52E-01	5.2	-	-	260	10.4	Yes	Yes	0.0971%	0.0072%
Bis(2-ethylhexyl)phthalate	3.70E-03	7.79E-05	2.63E-02	5	10	-	250	10	Yes	Yes	0.0105%	0.0008%
Bromoform	1.98E-03	4.16E-05	1.41E-02	5.2	-	-	260	10.4	Yes	Yes	0.0054%	0.0004%
Carbon disulfide	6.59E-03	1.39E-04	4.69E-02	31	-	-	1550	62	Yes	Yes	0.0030%	0.0002%
Carbon Tetrachloride	7.17E-03	1.51E-04	5.10E-02	31	-	-	1550	62	Yes	Yes	0.0033%	0.0002%
2-Chloroacetophenone	3.55E-04	7.47E-06	2.52E-03	0.32	-	-	16	0.64	Yes	Yes	0.0158%	0.0012%
Chlorobenzene	6.24E-03	1.31E-04	4.44E-02	46	-	-	2300	92	Yes	Yes	0.0019%	0.0001%
Chloroform	7.03E-03	1.48E-04	5.00E-02	49	-	-	2450	98	Yes	Yes	0.0020%	0.0002%
Cumene	2.69E-04	5.65E-06	1.91E-03	246	-	-	12300	492	Yes	Yes	0.00002%	0.000001%
Cyanide	1.27E-01	2.67E-03	9.02E-01	5	-	-	250	10	Yes	Yes	0.36%	0.0267%
2,4-Dinitrotoluene	1.42E-05	2.99E-07	1.01E-04	1.5	-	-	75	3	Yes	Yes	0.0001%	0.0000%
Dimethyl Sulfate	2.43E-03	5.12E-05	1.73E-02	0.52	-	-	26	1.04	Yes	Yes	0.067%	0.0049%
Ethyl benzene	9.23E-03	1.94E-04	6.56E-02	434	543	-	13575	868	Yes	Yes	0.0005%	0.00002%
Ethyl Chloride	2.13E-03	4.48E-05	1.51E-02	2640	-	-	132000	5280	Yes	Yes	0.00001%	0.000001%
Ethylene Dichloride	2.03E-03	4.27E-05	1.44E-02	40	-	-	2000	80	Yes	Yes	0.0007%	0.0001%
Formaldehyde	5.40E-02	1.14E-03	3.84E-01	1.2	2.5	-	62.5	2.4	Yes	Yes	0.61%	0.047%
Hexane	3.40E-03	7.15E-05	2.42E-02	176	-	-	8800	352	Yes	Yes	0.0003%	0.00002%

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Isophorone	2.94E-02	6.19E-04	2.09E-01	-	-	28	700	-	Yes	Yes	0.0299%	NA
Methyl Bromide	8.11E-03	1.71E-04	5.77E-02	19	-	-	950	38	Yes	Yes	0.0061%	0.0004%
Methyl Chloride	2.69E-02	5.65E-04	1.91E-01	103	-	-	5150	206	Yes	Yes	0.0037%	0.0003%
Methyl ethyl ketone	1.98E-02	4.16E-04	1.41E-01	590	885	-	22125	1180	Yes	Yes	0.0006%	0.00004%
Methyl hydrazine	8.62E-03	1.81E-04	6.13E-02	-	-	0.38	9.5	-	Yes	Yes	0.65%	NA
Methyl Methacrylate	1.01E-03	2.13E-05	7.21E-03	410	-	-	20500	820	Yes	Yes	0.00004%	0.000003%
Methylene Chloride	1.47E-02	3.09E-04	1.05E-01	174	-	-	8700	348	Yes	Yes	0.0012%	0.00009%
Naphthalene	2.88E-05	6.05E-07	2.05E-04	52	79	-	1975	104	Yes	Yes	0.00001%	0.000001%
Phenol	8.74E-03	1.84E-04	6.21E-02	19	-	-	950	38	Yes	Yes	0.0065%	0.00048%
Tetrachloroethylene	2.18E-03	4.59E-05	1.55E-02	339	1357	-	33925	678	Yes	Yes	0.00005%	0.00001%
Toluene	1.22E-02	2.56E-04	8.65E-02	377	565	-	14125	754	Yes	Yes	0.0006%	0.00003%
1,1,2-Trichloroethane	1.06E-03	2.22E-05	7.51E-03	55	-	-	2750	110	Yes	Yes	0.0003%	0.00002%
Styrene	2.95E-01	6.20E-03	2.10E+00	213	426	-	10650	426	Yes	Yes	0.020%	0.0015%
Xylenes	5.55E-03	1.17E-04	3.95E-02	434	651	-	16275	868	Yes	Yes	0.0002%	0.00001%
Vinyl Acetate	1.88E-03	3.95E-05	1.34E-02	35	70	-	1750	70	Yes	Yes	0.0008%	0.00006%
Vinly Chloride	2.90E-03	6.11E-05	2.07E-02	13	-	-	650	26	Yes	Yes	0.0032%	0.00023%